

Assessing Human Task Performance When Performing Electronic Procedures, Phase I

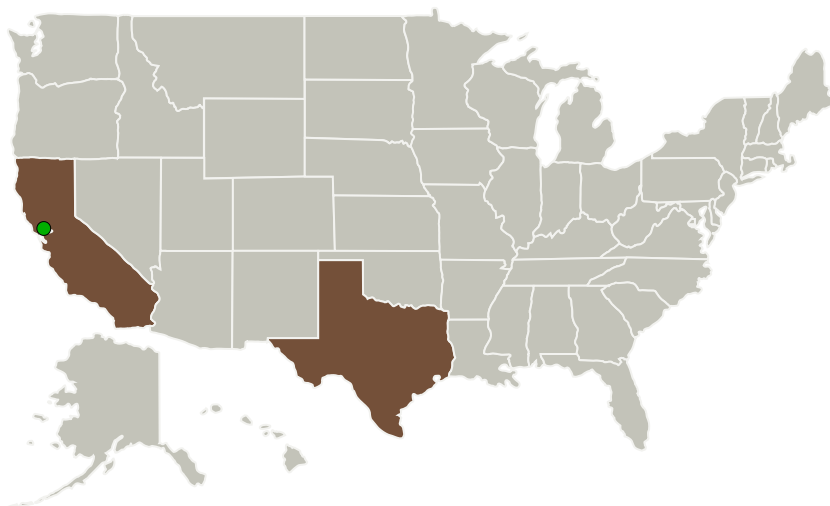
Completed Technology Project (2011 - 2011)



Project Introduction

Limited astronaut time can result in high crew workload and fatigue during International Space Station (ISS) operations. Additionally crew skills can decline over extended mission duration onboard ISS. These stressors can impact task performance both in terms of increased errors and decreased efficiency. As humans go deeper into space, these issues will become even more pronounced. Methods are needed to monitor tasks as they are performed and to detect degraded task performance. TRAC Labs proposes to develop algorithms and software for monitoring human performance of procedures. Our approach will integrate performance measuring software with procedure software and the displays used to execute procedures. We will build on prior work by TRAC Labs on the Procedure Representation Language (PRL) and our agent software that aids humans interacting with PRL procedures. The performance measuring software will use techniques developed at the University of Pittsburgh that monitor keystrokes and mouse utilization to compute the speed and accuracy of individual pointing and text entry actions and adherence to procedure definitions. We will adapt techniques for measuring task performance of the disabled to measuring task performance of the able-bodied when stressed. We propose that performance changes due to these situational disabilities can be detected in the same way as performance changes due to physical disabilities. These techniques are particularly attractive for use at NASA because they are non-invasive and do not require additional equipment to implement. Performance measures will be computed in real-time as tasks are performed and thus will be available for use during task performance. Procedure information will guide the collection and interpretation of the human task performance data.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
TRAC Labs, Inc.	Lead Organization	Industry	Webster, Texas
● Ames Research Center (ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Texas

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Summary: Assessing Human Task Performance when Performing Electronic Procedures, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image (<https://techport.nasa.gov/file/138009>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

TRAC Labs, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

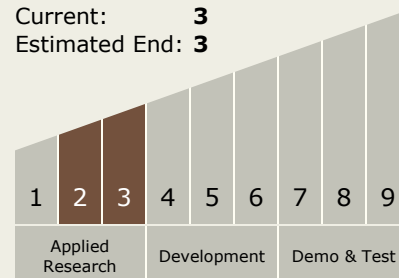
Carlos Torrez

Principal Investigator:

Debra L Schreckenghost

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.6 Human Systems Integration
 - └ TX06.6.1 Human Factors Engineering

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System